

Amendment to the Claims

1. (Cancelled)

2. (Currently amended) The method of claim 4 6, further comprising the step of deinterleaving at least one of the segments to form the at least two ~~symbols~~ samples.

3. (Currently amended) The method of claim 4 6, wherein the representative ~~symbol~~ sample is the same for at least two ~~symbols~~ samples.

4. (Currently amended) The method of claim 4 6, wherein the threshold is the same for each summed signal identity output.

5. (Cancelled)

6. (New) A method of detecting and identifying one of a plurality of known sequences in a received signal and a frequency offset associated with that signal, comprising the steps of:

segmenting the received signal into at least a first and a second segment, each having at least two samples;

correlating each of the samples in the at least first and second segments with a representative sample to produce at least a first and a second set of sample correlation outputs;

producing at least a first and a second set of signal identity outputs, the first set of signal identity outputs indicating a degree of match between a first signal represented by the first set of sample correlation outputs and each of a plurality of expected signal identities, and the second set of signal identity outputs indicating a degree of match between a second signal represented by the second set of sample correlation outputs and each of the plurality of expected signal identities;

providing a plurality of frequency offset compensations to the at least first and second set of signal identity outputs to produce for each frequency offset compensation at least a first and second set of frequency offset compensated signal identity outputs, each frequency offset compensation corresponding to a different possible frequency offset that affected the received signal, for each frequency offset compensation a different frequency offset multiplication factor being applied to each of the at least first and second sets of signal identity outputs;

for each frequency offset compensation, coherently summing corresponding signal identity outputs from the at least first and second sets of frequency offset compensated signal identity outputs to form for each frequency offset compensation a plurality of summed signal identity outputs;

comparing to a threshold at least one summed signal identity output from the plurality of summed signal identity outputs formed for each frequency offset compensation to produce a set of threshold exceeding summed signal identity outputs; and

selecting, based on magnitude, at least one threshold exceeding summed signal identity output to detect and identify the received signal and the frequency offset associated with the detected and identified received signal.